[Tahiti.—From an original Sketch.]

TAHITI.

Tahiti, or, as it has been more commonly called, Otaheite, is the largest of a group of islands now generally known as the Society Islands, lying in the South Pacific Ocean. The following are the names and positions of these islands. The names are given according to the orthography introduced by the first missionaries, and used by the press now established among the people:—

	S. lat.	W. long.
Meatia	17° 53′ 0″	148° 9′ 45″
Tahiti (Otaheite), north point	17 29 17	149 33 15
Eimeo	17 30 0	150 0 0
Maiaoiti, or Charles Sander's Island	17 28 0	150 40 0
Tetuaroa.		
Huahine	16 43 0	151 6 45
Raiatea	16 46 0	151 38 45
Tahaa, three miles N. of Raiatea.		
Borabora	16 27 0	151 52 45
Mauarua	16 10 0	152 30 0
Tubai.		
Lord Howe's Island	16 46 0	154 12 45
Scilly Island	16 28 0	155 24 45

The first five form a cluster which were originally called by Captain Cook the Georgian Islands, in honour of George III.; the others, lying about sixty miles south-east of Otaheite, being named by him the Society Islands, in honour of the Royal Society of London. Mariners usually distinguish the latter as the Leeward and the former as the Windward Islands.

Of all these islands, Tahiti is by much the largest and the most elevated. All the islands are mountainous in the interior, and have a border, from one to four miles wide, of rich level land, extending from the base of the high land to the sea; and although the outline of each has some peculiarity distinguishing it from the rest, in their general appearance they resemble each other. Tetuaroa, Tubai, Lord Howe's and the Scilly Islands, however, form exceptions, as they are low coral islands, seldom rising many feet above the sea. Tahiti is thirty-five miles long, and one hundred and eight miles in circumference, containing an area about equal to Bedfordshire; Eimeo is supposed to be about twenty-five miles; Huahine probably more than thirty; and Raiatea is somewhat larger. The others are of smaller extent. A corresponding resemblance prevails in the geological structure of the principal clusters and surrounding islands; the component substances being the same in all, although each has some distinguishing peculiarity of its own. A full account of these geological characteristics, analogous and distinctive, may be found in Ellis's 'Polynesian Researches.' There seems no reason to suppose that any of these islands are of altogether volcanic origin, like the Sandwich Islands. All the Society Islands, and many others in the Pacific, are surrounded by a belt of coral rock, from two or three to twenty yards in width, and situated at distances from a few yards to perhaps two miles from the shore. Against this barrier the long rolling waves of the wide Pacific are driven with terrific violence by the trade-winds, and, arrested by it, often rise ten, twelve, or fourteen feet above its surface. These reefs protect the low lands from the violence of the sea; for while, beyond them, the surface of the water is agitated by the slightest breeze, all within is smooth water. There is usually a break or opening in these marine barriers, which offers an easy passage for shipping. In Tahiti there are several good ports; those on the north-west coast, Matavai, Papawa, Toanoa, and Papiété, are the most frequented. The soil is various. The sides of the mountains are frequently covered with a thin layer of light earth; but the summits of many of the inferior hills present a thick stratum of stiff red

ochre or yellow marl. This is seldom found on the lofty mountains composed of basalt or cellular volcanic stone, but generally covers the lower hills that rise between the interior mountains and the shore. The natives use it as a pigment for staining or painting their doors, window-shutters, canoes, &c., and, when mixed with lime, the walls of their houses. The level tracts along the coast are the most valuable parts of the land. The soil of those tracts is a rich alluvial deposit, with a considerable mixture of vegetable mould, and is exceedingly prolific.

Rain is much more frequent in the Society than in the Sandwich Islands, during the whole year; but, except in the rainy season, it is seldom heavy or lasting. The rainy season, the only variation of the tropical year, occurs when the sun is vertical, and generally continues from December to March; during this time the climate is more insalubrious and the sickness of the inhabitants greater than at any other period. Thunder and lightning are frequent, especially in the rainy season.

Hogs and dogs, and sometimes rats, were the only animals whose flesh was formerly eaten by the natives. The missionaries have introduced all our domestic animals; and all have succeeded very well, except the sheep. Many of the natives now possess hundreds of cattle, which, with their other produce, they sell, with mutual advantage, to the ships which touch at the islands for refreshments. Rabbits could not be preserved; cats have become common in houses, and are great favourites. The birds of these and the neighbouring islands are not distinguished by brilliancy of plumage or melody of song. There are, however, several varieties, and some of them in immense numbers. The most numerous class are the aquatic fowl. The albatross (*diomeda exulans*), the tropic bird (*phaeton ætherius*), several kinds of petrel, with others, abound in all the islands, especially in Borabora and Manarua. Among the lakes are several kinds of heron; and wild ducks resort to the lagoons and marshes. There are several kinds of birds of prey, and a number of the woodpecker tribe, with some small paroquets of rich and splendid plumage. The turtle-dove is found in the inland parts of some of the islands, and pigeons among the mountains. Among the few singing-birds the most conspicuous is that called by the natives *Omaomao*, which in appearance and note much resembles the thrush. Poultry was found in abundance in the islands when originally discovered, and have, of course, been since improved and extended.

The vegetable productions are numerous, especially of the plants which supply food for man. The bread-fruit trees and cocoa-palms are regularly planted, and batatas, yams, taro, and bananas are cultivated with care; the sugar-cane, which is of excellent quality, tobacco, and some other tropical plants are also cultivated. Cotton and indigo are only cultivated by the Europeans, the natives being too indolent to bestow the necessary labour on them. Several wild plants also afford food, especially the arrow-root, which is collected in May, and a considerable quantity of which is exported; there are also the casuarina-tree, a kind of chestnut, and figs. Cloth is made, as in other islands of the Pacific, of the inner bark of the bread-fruit tree, the paper mulberry-tree, and the hibiscus; of the last also ropes are made. Oil is extracted from the cocoa-nut. The interior produces timber in great abundance. Forests cover all the mountains of Tiarraboca, and the southern declivities of those of Opureone. Some vessels have been built of the timber.

The Society Islanders are generally above the middle stature, but their limbs are much less muscular and firm than those of the Sandwich Islanders, whom in many respects they resemble; but they are more robust than the Marquesans, who are the most light and agile of the inhabitants of Eastern Polynesia. In size and physical power they are inferior to the New Zealanders. The countenance of the Society Islanders is open and prepossessing, though the features are bold, and sometimes prominent. The facial angle is frequently as elevated as in the European, except where the frontal and the occipital bones have been pressed together in infancy. The prevailing complexion is an olive, a bronze, or a reddish-brown, equally removed from the jet-black of the African and Asiatic, the yellow of the Malay, and the red or copper colour of the aboriginal Americans. Considerable variety nevertheless prevails in the complexion of the population of the same island, and as great a diversity among the inhabitants of the different islands.

The mental capacity of the Society Islanders has hitherto been only partially developed. They are remarkably curious and inquisitive; and, compared with other Polynesian nations, may be said to possess considerable ingenuity, mechanical invention, and imitation. Totally unacquainted with the use of letters, their minds could not be improved by any regular continued culture; yet the distinguishing features of their civil polity—the imposing nature, numerous observances, and diversified ramifications of their superstition—the legends of their gods—the historical songs of their bards—the beautiful, figurative, and impassioned eloquence sometimes displayed in their national assemblies—and, above all, the copiousness, variety, precision, and purity of their language, with their extensive use of numbers, warrant the conclusion that they possess no mean mental capabilities.

By diseases, wars, infanticide, and the use of ardent spirits, the large population which these islands formerly contained was reduced to a mere remnant when the missionaries came among them, and was in rapid progress to extinction. The general adoption of Christianity put a stop to the evils in which this decline had originated; but for some years after, the number of deaths considerably exceeded the births. About the years 1819 and 1820, the births were nearly equal to the deaths, and since that period the population has been rapidly increasing. The latest information estimates the inhabitants of these islands at eighteen or twenty thousand. Most of the natives can now read and write. Their moral conduct has become more regular, and their social condition much improved; they have acquired the knowledge of various useful arts, and profitable branches of commerce have been opened. Numerous vessels of from thirty to eighty tons burden are usefully employed in trade, and in maintaining an intercourse between the several islands. A press has for many years been actively engaged in supplying the natives with publications in their own language, suited to their wants and their condition.

For these advantages the Society Islands are chiefly, we may almost say entirely, indebted to the exertions of the missionaries. Under their influence Pomare II. embraced Christianity in 1816, and framed a constitution and a code of laws, which, in 1825, under his son, was extended so as to include a parliament, of which the members are returned from the several districts by popular election. The legal penalties are severe, but extend to death in but few cases, and there is a regular police. Captain W. F. Beechey, who visited these islands, in 1826, in the Blossom, thus describes the proceedings of a legal court:—"The court was ranged upon benches placed in successive rows under the trees, with the prisoners in front, under the charge of an officer with a drawn sabre, and habited in a volunteer's jacket and a maro. The aava-rai of the district in which the crimes had been committed took his place between the court and the prisoners, dressed

in a long straw mat, finely plaited, and edged with fringe, with a slit cut in it for the head to pass through; a white oakum wig, which, in imitation of the gentlemen of our courts of law, flowed in long curls over his shoulders, and a tall cap surmounting it, curiously ornamented with red feathers, and with variously coloured tresses of human hair. His appearance without shoes, stockings, or trowsers, the strange attire of the head, with the variegated tresses of hair mingling with the oakum curls upon his shoulders, produced, as may be imagined, a ludicrous effect. The prisoner being brought up, the aava read certain passages from the penal code, and then accused the prisoner of having stolen a gown from a European resident. He instantly pleaded "guilty" to the charge, and thereby saved a great deal of trouble. He was then admonished against the repetition of evil practices, and fined four hogs, two to the king, and two to the person from whom the property had been stolen. Bail is not necessary in Otaheite; and the prisoner, consequently, was allowed to go where he pleased; and he proceeded to such of his friends as were most likelyto supply him with a hog."

Notwithstanding, however, the efforts of the missionaries, the morality of the islanders continues very loose, especially in respect to chastity and honesty; nor has the executive sufficient power to exact obedience from the Europeans, who are now numerous, when they are refractory. Sir Edward Belcher, on his visit in the Sulphur, in 1840, was called upon for his assistance in enforcing the verdicts of Otaheitan juries against British subjects, which, greatly to his credit, he readily afforded, and he narrates an instance in which the Queen's husband was indicted before a jury for a violation of the law in connexion with one of these cases, where, after several efforts to avoid the trial, he was found guilty, though his punishment only amounted to a lecture. Sir Edward also notices the progress made in civilization in the interval between 1826 and 1840, particularly in regard to clothing, which had become in a great degree European; but he adds with this progress they appear to have lost much of their old simplicity of character, and even much of their religious feelings. Indeed the missionaries seem, by their extreme strictness, to have lost their hold on a people indolent, sensual, and addicted to pleasure; they absolutely prohibited their national dance, and most of their other peculiar customs; and when the first excitement of their religious feelings had subsided, they naturally reverted to their remembrance with feelings of regret. It is no doubt extremely difficult to decide in such cases what may be advisably allowed, but it must evidently be dangerous to deprive an imperfectly civilized and but half-occupied people of their usual active amusements. From the testimony of Captain Beechey, the character of the dance, to which the missionaries no doubt with justice object, might have been, and was occasionally even by themselves, modified so as to be wholly inoffensive. At any rate it is supposed that it was the unpopularity arising from these restrictive measures that gave rise to the recent step taken by the nation of placing itself under the protection of France. This event took place in 1842: Roman Catholic missions have been already formed and sent out, and other steps taken by the French government for securing a permanent establishment in the islands.

Nest of the Halcyon or Kingfisher.—Setting aside the fable of the floating cradle in which during the Halcyon days the bird was said to rear its young, we shall find that ornithologists have differed not a little as to the actual nest of this brilliant bird. Pennant says that it makes its nest in holes in the sides of cliffs, which it scoops to the depth of three feet, and in holes in the banks of rivers, chiefly those which before belonged to the water-rat; and he states the number of the eggs to be from five to nine, of a most beautiful transparent white. The nest, he adds, is very fetid. Montagu, in his 'Ornithological Dictionary,' says that the bird generally takes possession of a rat's hole to deposit its eggs; he then proceeds as follows:—"The many curious accounts which have been given of the nest of this bird induced us to take some pains to discover the fact. The result of our researches are (is), that the hole chosen to breed in is always ascending, and generally two or three feet in the bank; at the end is scooped a hollow at the bottom of which is a quantity of small fish-bones, nearly half an inch thick, mixed in with the earth. This is undoubtedly the castings of the parent birds, and not the young, for we have found it even before they have eggs, and have every reason to believe that both male and female go to that spot, for no other purpose than to eject this matter, for some time before the female begins to lay, and that they dry it by the heat of their bodies, as they are frequently known to continue in the hole for hours, long before they have eggs. On this disgorged matter the female lays to the number of seven eggs, which are perfectly white and transparent, of a short oval form, weighing about one dram. The hole in which they breed is by no means fouled by the castings; but before the young are able to fly it becomes extremely fetid by the fæces of the brood, which is (are) of a watery nature, and cannot be carried away by the parent birds, as is common with most of the smaller species. In defect of which, instinct has taught them to have the entrance of their habitation ascending, by which means the filthy matter runs off, and may frequently be seen on the outside. We never could observe the old birds with anything in their bills when they went to feed their young; from which it may be concluded they eject from their stomach for that purpose." Mr. Selby, after noticing the ejection of bones and other indigestible parts, in pellets, by the mouth of these birds, goes on to state that they breed in the banks of the streams they haunt, either digging a hole themselves, or taking possession of that of a water-rat, which they afterwards enlarge to suit their convenience. He then proceeds as follows:—"The bearing of the hole is always diagonally upwards, and it pierces two or three feet into the bank The nest is composed of the above-mentioned pellets of fish-bones, ejected into a small cavity at the farther end of this retreat, and upon which the eggs are laid, to the number of six or seven, of a transparent pinkish white." He then quotes the remarks of Montagu on the sloping direction of the hole, and the use of that direction in carrying away offensive matter. ('Illustrations of British Ornithology,' vol. i.) Mr. Rennie, in his edition of Montagu's 'Dictionary,' observes, that from the high authority of Montagu, the description above given has been copied by every recent writer, with the exception of Temminck, who says nothing on the subject, and Wilson, who says ('Am. Orn.,' iii. 60), of his belted kingfisher (*Alcedo Alcyon*), that "its nest is neither constructed of glue nor fish-bones." Mr. Rennie then proceeds thus:—"We are certain of the fact that this will apply equally to our own kingfisher. In the bank of a stream at Lee in Kent, we have been acquainted with one of these nests in the same hole for several successive summers, but so far from the exuviæ of fish-bones ejected, as is done by all birds of prey, being dried on purpose to form the nest, they are scattered about the floor of the hole in all directions, from its entrance to its termination, without the least order or working up with the earth, and all moist and fetid. That the eggs may by accident be laid upon portions of these fish-bones is highly probable, as the floor is so thickly strewed with them that no vacant spot might be found, but they assuredly are not by design built up into a nest. The hole is from two to four feet long, sloping upwards, narrow at the entrance, but widening in the interior, in order perhaps to give the birds room to turn, and for the same apparent reason the eggs are not placed at the extremity. I am not a little sceptical as to its sometimes selecting the old hole of a water-rat, which is a deadly enemy to its eggs and young; but it seems to indicate a dislike to the labour of digging. It frequents the same hole for a series of years, and will not abandon it, though the nest be repeatedly plundered of the eggs or young. The accumulation of cast-bones in one of these old holes has perhaps given origin to the notion of the nest being formed of them." Mr. Gould, in his 'Birds of Europe,' states that the eggs are deposited in a hole, such as those above alluded to, by the female, without making any nest.—*Penny Cyclopædia.*

[The Stepping-Stones.]

THE RIVER DUDDON.—No. II.

[Continued from p. 238.]

THE old Whitehaven road crosses the river at Cockley Brig, and here leaves it, passing over the side of the mountain called Hardknot into Eskdale. Somewhat more than halfway down the hill, a little on the right of the road, are the remains of a Roman fortress, "Hardknot Castle," as it is called, which is well worth a visit: there is a fine and very extensive view from it; Scawfell in particular is seen to great advantage. From Cockley Brig the scenery, for a mile or so, is rather tame along the beck, but if there is little in the vicinity, there is much in the stream itself to delight us. Now it has assumed something of the port and strength of a river: the water too, which, like Cotton's favourite Dove, was "black at its source because it springs from the mosses," has, like it, become "so clarified by the addition of several clear springs, bigger than itself, which gush out of the limestone rocks, that in a few miles you will find it one of the purest crystalline springs you have seen." Wordsworth notices this: "The water," he says, "is perfectly pellucid, through which in many places is seen to a great depth its bed of rock or blue gravel, which gives to the water itself an exquisitely cerulean colour:" this is very observable hereabouts. And here too are *The* Stepping-Stones: every reader of Wordsworth will remember them, and most will "have a vision of his own" about them. He need not fear that the reality will fall short of his conception. We have seen many, but none sure so graceful:—

> "They might seem a zone
> Chosen for ornament—stone matched with stone
> In studied symmetry, with interspace
> For the clear waters to pursue their race
> Without restraint."—*Sonnet IX.*

And they are as harmonious in colour as symmetrical in form. Of a delicate white with the slightest admixture of blue, they present, as they are reflected in the crystal stream, an image the eye dwells on with a *continuous* pleasure. They are a something to remember. Hitherto our stream has wound quietly among the masses of crag that have, at various times, been brought down by it from its parent fells; but soon after we have passed the stepping-stones, it boldly forces its way through the solid rock, which it has wrought into many strange fantastic forms.

> "Objects immense portrayed in miniature,
> Wild shapes for many a strange comparison!
> Niagaras, Alpine passes, and anon
> Abodes of Naiads, calm abysses, pure
> Bright liquid mansions."—*Sonnet XII.*

The traveller should not leave the bed of the river here while he can make his way along it; every step brings out some new or quaint device of our fairy-like guide. Not far from the place above referred to, is a chasm where the sublime and the fanciful seem striving for the mastery; a strange spot as ever was pitched upon. well might Wordsworth call it the "Faëry Chasm." Its steep rocky sides are of a bright blue-grey tint, deepening under the water almost into azure, and riven into such strange shapes as that "tricksy spirit" Ariel might have delighted to fashion. The scenery too about this spot is very fine: on one hand are Hardknot and its associate mountains; on the other various crags, backed by the majestic mass of Coniston Old Man. Directly in front are Walla-barrow crag and the Pen, with several mountains of moderate elevation and graceful form in the distance.

Here we must leave our stream awhile. We have now reached Seathwaite, where for the present we stay. Wordsworth, indeed, makes his poem a summer day's journey, but he admits this to be a poetic licence. It is quite impossible to explore the scenery of the Duddon in that time. The hasty visitor may indeed see it all, at least as well as he usually sees anything in two days; but the man who has learned to look on nature with a truer feeling will not, if he have leisure, think as many weeks too much to devote to this lovely region. Seathwaite is a good resting-place: it is in the midst of the finest portion of the scenery, and has connected with it some interesting associations, upon which we shall now touch. It contains too a little inn, in which the accommodation is rude, but the parties who keep it are civil and desirous to oblige, and the genuine traveller will be content with these. He need not, however, fare amiss: fell-mutton, and ham, and mutton-ham he may always obtain; and trout too,

if he will, as Mrs. Glasse directs, "catch them first"—for Duddon is what "honest Izaak" calls "a trouty stream." With these, and the usual addenda procurable in a north-country farm, a moderate man may have, as Cowley says, "not so many choice dishes at every meal; but at several meals all of them, which makes them both the more healthy and the more pleasant."

Seathwaite is remarkable as the place in which "Wonderful Robert Walker" dwelt so many years. Wordsworth has given a very full and interesting account of him in his notes to 'The Duddon,' to which, or to the second volume of 'The Pursuit of Knowledge under Difficulties,' the reader may refer. It may here suffice to say that he was born in 1709, at Under-crag in Seathwaite, and was the youngest of twelve children. Being sickly in youth, he was "bred up a scholar," and after acting for some time as a schoolmaster, he was ordained, and about 1735 became Curate of Seathwaite, in which he remained till his death, sixty-six years afterwards. The value of his curacy when he entered upon it was 5*l*. per annum, with a cottage; about the same time he married, and his wife brought him, as he says, "to the value of 40*l*. for her fortune." He had a family of twelve children, of whom however only eight lived; these he educated respectably—one at least became a clergyman—was even munificent in his hospitality as a parish priest, and generous to the needy, and yet, although the income of his curacy never exceeded 50*l*. per annum, "at his decease he left behind him no less a sum than 200*l*.; and such a sense of his various excellencies was prevalent in the country, that the epithet of *Wonderful* is to this day attached to his name." As Wordsworth says, there is in this something so extraordinary as to require further explanatory details, but for these we refer to the works before named, merely remarking that he spun the wool, needed for the family clothing, himself, which was made up into the various garments by the female portion of the family; while he spun, he taught the children of his parishioners: then he assisted his neighbours in hay-making, sheep-shearing, &c., besides serving as scrivener, and in various ways rendering them assistance; had an acre or two of land, which he tilled himself, and also possessed and attended to a few sheep and a couple of cows. Many of these employments, and others in which his biographer relates him to have been engaged, are sufficiently unclerical, but we were told, by some of the older inhabitants, of one still more so, and which Wordsworth either did not hear of or thought too unpoetical to repeat. At that time there was no public-house in the place, and Walker was accustomed, they said, to supply any who required such refreshment with ale of his own brewing, charging for it a certain price, and two-pence per quart extra if drank in his house; the usual place for drinking it being the adjacent field. The circumstance would hardly be worth recording did it not serve to illustrate the singular simplicity of manners that prevailed. Such a thing can hardly be conceived of elsewhere at that period as a clergyman making his house in some sort a tavern. Southey indeed tells* that up to the middle of the reign of George II., such cures were held in these northern counties by unordained persons, who commonly added to their scanty income by the pursuit of some manual occupation. The person, for instance, who held the curacy in the Vale of Newlands, near Keswick, at that period, exercised the various trades of tailor, clogger, and butter-print maker. We ought not to omit either, that, amid all his various laborious occupations, he is said to have preserved his affections unimpaired, to have carefully and successfully cultivated his intellect, and yet been

* 'Colloquies,' i., 308.

[Seathwaite Chapel.]

tenderly alive to the duties of his pastoral office: truly, as Wordsworth remarks, "in this extraordinary man things in their nature adverse were reconciled."

Very many of the simple homely customs ascribed to Walker are yet far from obsolete in the neighbourhood. In the farm-houses the master of the house may still be seen at the head of a long table, with his farm servants sitting down to their meals as part of the family. Rush candles are yet employed in common, "white or tallow candles being reserved," as with Walker, "for important occasions." And we imagine tea is even now very little used, except by the more wealthy farmers, at whose houses indeed we have seen it. Neither Walker nor his wife ever partook of it, though they kept it in the house for visitors or such of his own family as had been accustomed to this refreshment elsewhere. Porridge was their substitute, and it is still employed at the meals answering to breakfast and tea. At the public-house at Seathwaite, the landlord of which is also a farmer, this is the case, and we were somewhat amused, after we had finished our tea, to see the tea-pot very quietly taken to the landlord, and tea made for him alone, from the tea-leaves which had just served us. When the master of the house happened at such times to be from home, his mother (he had no wife), an old but vigorous dame, appropriated the luxury to her own use.

There are few places in our country perhaps that have changed so little as has Seathwaite since Walker's time; there have been no new buildings, nor has anything altered the external look of the place, unless it be the addition of the public-house, and that is an old farm-house. Walker's own house has been altered since his death, but only so much as to render it somewhat more convenient to his successor. Nor have the inhabitants greatly changed; they are still the same frugal, industrious, quiet, church-going race: there is indeed a slight change in the last item. Walker congratulates himself that there is "not one dissenter of any denomination in the parish," and now there are several Methodists, and two or three Baptists, who have occasional meetings at private houses, for there is still no dissenting meeting-house in Seathwaite; but the chief part of the inhabitants are still steady churchmen.

The chapel in which Walker so long officiated is a simple structure, a low oblong building with a plain porch, and one bell, hung visibly in a most primitive-looking belfry, with the bell-rope hanging down on the outside. It differs little in its appearance from many other chapels scattered thoughout the more retired parts of the locality; it is not, however, so small as many of them, that at Wasdale Head for instance, which has seven pews, one being for each of the six families in the chapelry, and the remaining one for strangers. Seathwaite churchyard contains a fine old yew, and near it a sun-dial, by which is Walker's grave-stone, a plain blue slab, shown in the engraving: upon it is the following inscription:—

"In memory of the Reverend Robert Walker, who died the 25th day of June, 1802, in the 93rd year of his age, and 67th of his curacy at Seathwaite.

"Also of Anne, his wife, who died the 28th of January, 1802, in the 93rd year of her age."

The noticeable thing in the interior of the chapel is Walker's pew, which is still lined with cloth woven by his own hand—it is the only pew in the chapel so distinguished.

There is about Seathwaite chapel an air of antique rudeness, that at once carries the mind back to a bygone age; it speaks as strongly of other times as the noblest minster—but how differently! We advise the visisor, if he can, to spend a Sunday there. Few sights would be more interesting to one not thoroughly sophisticated than the old kirk-yard on a Sabbath morning. *Then* the old kirk—the noble yew, older still than the kirk, with the sun-dial by it—the few grave-stones scattered about, and the everlasting hills—which form so noble a background to the whole—all seem to wear an air of deeper repose and more silent grandeur than ever. But presently the bell tolls, and its first sounds have hardly passed away when one and another of the dalesmen come quietly in, giving and receiving a simple greeting, and then separating into little groups, or loitering singly about the graves, apparently recalling, many of them at least, the memory of those who sleep below, while others collect under the shade of the old yew; the fairer portion of the congregation meantime resting on the benches within the porch, but none, at least in fine weather, enter the chapel. Soon, however, as the bell's last stroke has sounded, the clergyman, a happy-looking old man—apparently no unworthy successor of Walker—may be seen making his way towards the kirk, exchanging with all a smile, a word, or a bow of genuine old-fashioned courtesy (and the stranger will be sure to receive one more marked than others), and after a little longer talk with his fair parishioners in the porch, he enters the chapel, followed by his charge. Next to seeing Sir Roger de Coverley go to church, it is the prettiest sight of the kind one could wish to behold.

"Upon the Seathwaite Brook," says Wordsworth "at a small distance from the parsonage, has been erected a mill for spinning yarn; it is a mean and disagreeable object, though not unimportant to the spectator, as calling to mind the momentous changes wrought by such inventions in the frame of society." We went to look at the mill, and found it with its roof partly fallen in, its wheel broken; and on trying the door, its hinges, rusted from long disuse, gave way The machinery, too, though in appearance undisturbed since it was last used, was decayed, the web crumbling at the slightest touch. Our poet, were he to visit it now, might find new matter for reflection on the changes wrought by the progress of invention, which has rendered this as obsolete as it made unaided hand-labour.

[To be continued.]

ON ROTTEN-STONE AND EMERY.

THERE are two substances, apparently very humble, which however contribute in an important degree to the perfection of various instruments, both of use and of ornament. These are *Tripoli*, or *rotten-stone*, and *Emery*, both extensively employed in grinding and polishing glass, metals, stones, and other hard substances. The names applied to these two substances seem at first to be odd and unmeaning; but the origin appears to have been thus:—that 'Tripoli' is the name of the country whence one of these polishing substances was first brought; that 'rotten-stone' expresses significantly its mineral origin; and that 'emery,' with its French, Italian, Latin, and Greek synomymes, 'emeri,' 'smeriglio,' 'smyris,' and 'smuris,' all come from the Greek verb 'to smooth' or 'to polish,' and thereby indicate the purpose to which the substance is applied.

For a long time the true nature of tripoli was not known, whether it was of a clayey or a flinty origin. This arose from certain differences in the kinds brought from different places. Thus the tripoli of Poligné, near Rennes in Brittany, is fusible; it has several different shades of red colour, and in some parts trunks of trees, imbedded in it, seem almost to have been changed into tripoli. Tripoli is found at Ménat, near Riom, department of Puy-de-Dôme, in beds which

appear to have been formerly schists (slaty or laminated rocks), changed by the action of volcanic fire. It occurs in the quarries of chalcedony at Volterra in Tuscany, and assumes very much the appearance of the débris or decomposed fragments of chalcedony. In Saxony it occurs in the coal-strata at Postchappel; and in Bohemia it is found in thin beds of a kind of pitch-stone. The tripoli of Venice is the most esteemed; it comes from the island of Corfu, and has a yellowish-red colour. The tripoli from Derbyshire, called 'rotten-stone,' occurs in the upper part of the great shale stratum which covers the mountain-limestone.

The nature and formation of the Derbyshire 'rotten-stone' formed the subject of a communication from Mr. Martin to the Manchester Philosophical Society some years ago; and as that paper threw much light on the subject, we will transcribe the principal results.

Kirwan had before given an opinion that some varieties of tripoli were of volcanic origin, while others were the result of decomposition; and Mr. Martin proceeded to show that the Derbyshire rotten-stone is of this latter kind, and offered a conjecture that black marble, or some other dark variety of lime-stone, is the kind of rock whose decomposition forms rotten-stone. Of the rotten-stone of Bakewell, as an example of that of Derbyshire generally, Mr. Martin states that it is deposited in the uppermost stratum of limestone. It occurs in different parts of the moor; frequently on the surface of the limestone, immediately under the vegetable mould; but it is procured in the greatest quantity in a long or somewhat trough-shaped hollow, intersected by several broad irregular fissures, which are filled up with small fragments of limestone. In these fissures the rotten-stone occurs at the depth of a few inches below the surface, and from that to ten or fifteen feet.

The Derbyshire rotten-stone Mr. Martin describes as being produced in two distinct states. In the one state, the stone when dry has an indurated and sometimes stony consistency, with an earthy texture, a fracture sometimes shell-like and at other times slaty, a smooth and rather greasy feel, and a colour between yellow and brownish-grey. The other kind has a loose and powdery substance, a greater roughness to the touch, and qualities generally more resembling those of earth than of rock. The hard rotten-stone (as the former is called by the diggers) occurs in detached nodular lumps, dispersed through the débris of the limestone; whereas the soft rotten-stone occurs as a kind of spongy earth, either coating the more indurated variety or deposited in considerable quantities under the débris on the surface of the limestone rock. Water, from the upper part of the moor, is constantly draining through the loose materials which fill the hollow and fissures of the rotten-stone district. Among the rotten-stone are found fragments of chert, and other fragments in all the intermediate stages between perfect limestone and rotten-stone.

From all these circumstances combined, Mr. Martin concludes that rotten-stone is produced by the disintegration of a particular variety of limestone, probably a black marble.

The use of tripoli or rotten-stone as a polishing material is so very simple and so well known, that we need not stop to remark upon it, but may proceed to notice the nature and sources of the other substance which we have named, viz. *emery*.

It is not one of the least curious circumstances which mineralogical analysis has brought to light, that the sapphire, the ruby, adamantine spar, and emery are very nearly the same substance. The sapphire, which occurs in rolled masses and crystals, contains ninety-two per cent. of alumina, the rest being silica and oxide of iron. The ruby, occurring in six-sided prisms, contains ninety per cent. of alumina. Adamantine spar, or common corundum, used extensively in the East Indies in the polishing of gems and stones, contains ninety-one per cent. of alumina. Lastly, emery contains eighty-six per cent. of alumina; thus approaching very closely to the other three, and having, like them, only two other component ingredients besides alumina, viz. silica and oxide of iron.

Mr. Tennant, some years ago, was the first to discover that the emery of Europe is nearly the same substance as the corundum of the East. For many centuries emery has been found in one of the Greek islands, Naxos; but the relation between it and corundum is a modern discovery. Pliny, in the description which he has given of a green stone which the ancients called topaz, says it was the only gem that admitted the impression of a file; that all other gems were polished by means of the "grinding-stones of Naxos:" and in another part of his work he speaks of "naxium" as being used in polishing marble and gems.

Mr. Tennant, in the paper in which he showed the composition of emery, and which was published in the 'Philosophical Transactions' at the beginning of the present century, remarks:—"The hardness of emery, as far as I could judge by its cutting rock-crystal and flint, appeared to be equal to that of diamond spar. The latter could not be scratched by the former; but as emery has not a surface sufficiently polished to render a mark visible, the converse of this could not be tried. All the emery which is used in England is said to be brought from the islands of the Archipelago, and principally from Naxos. In those places it is probably very abundant; as the price of it in London, which I was told was eight or ten shillings the hundredweight, appears little more than sufficient for the charges of carriage. Though I saw a very large quantity in one place (more than a thousand hundredweight), I could not find any pieces of a crystallized form; possibly the great proportion of iron usually mixed with it may prevent its crystallization. The whole consisted of angular blocks incrusted with iron-ore, sometimes of an octahedral form, with pyrites, and very often mica. The latter frequently penetrates the whole substance of the mass, giving it when broken a silvery appearance, if seen in the direction in which the flat surfaces present themselves to the eye." The statistical part of these remarks would probably require modification, to suit the state of things at the present day.

The island of Naxos, spoken of by Pliny as containing abundance of emery, has been visited by several travellers who have offered a passing word on the existence there of the mineral. Tournefort, a hundred and thirty years ago, said that in his time the emery-mines were situated at the bottom of a valley beyond a place called Perato, in the island of Naxos; but that the inhabitants also found emery while ploughing the earth, and carried it down to the sea-coast, where the English ballasted their ships with it; and he further states that it was so cheap that twenty-eight hundredweight of it might be purchased for a crown. Dr. E. D. Clarke, while sailing from Patmos to Paros, touched for a short time on the southern coast of the island of Naxos, and, amongst other minerals, made a few remarks concerning emery. "The famous emery of Naxos is situated in an opposite part of the island, towards the north-west. The author has ever since regretted that his rough treatment at sea entirely banished from his recollection all thought of this important part of the natural history of Naxos. . . . . The author has succeeded in obtaining, by the accidental fracture of the compact emery of Naxos, as regular an hexagonal form as that which may be

noticed in the corundum of the Mysore; nor is it unreasonable to infer, as a probability, that Telesia, or perfect corundum, under the forms exhibited by the oriental sapphire and oriental ruby, may be found by future travellers in the mines of emery at Naxos."

The use of emery, as a substance for grinding and levelling, depends evidently on the extreme hardness of its particles. These particles wear away the protuberant parts of the surface to be levelled, more rapidly than they themselves wear away; it is in fact a contest between two rubbing surfaces as to which will yield to the other; and the popular phrase of "diamond cut diamond" expresses significantly the fact that nothing but the diamond can cut the diamond, it being harder than all other substances, emery included. One of the most important practical applications of this substance is in the grinding of lenses for microscopes, telescopes, and other mathematical instruments. Glass, being ranked among the hardest of substances, can be cut or worked by very few others, and it is important to obtain such an agent at a cheap rate.

The rocky emery is brought into the state of powder or of grains by a process extensively pursued in the islands of Jersey and Guernsey, and thus described by a French writer:—The emery is pounded in a steel mortar, and the bruised mass thrown into water, and mixed up with it. The mixture is left to repose until the water contains nothing but particles which are too fine and minute to be of service. The water is then thrown away, and new water poured on the emery: this is similarly stirred up, allowed to settle, and the water again poured off. By this means the finest sort of emery is produced. A fresh supply of water is added, and allowed to remain a quarter of an hour, when, being poured off, the next finer kind of emery is obtained. Another supply of water being added, and treated in a similar way, leads to the production of a third quality of emery. A succession of such processes enables the manufacturer to obtain several different degrees of fineness, thus adapting the emery to the purposes for which it is intended.

Sir David Brewster, in one of his Treatises on Optics, while speaking of the grinding of lenses for optical purposes, remarks:—"Emery of different degrees of fineness may be made in the following manner: Take five or six clean vessels, and having filled one of them with water, put into it a considerable quantity of flour-emery; stir it with a piece of wood, and after standing for five seconds, pour the water into the second vessel. After it has stood about twelve seconds, pour it out of this into a third vessel; and so on with the rest: and at the bottom of each vessel will be found emery of different degrees of fineness, the coarsest being in the first vessel, and the finest in the last." This process may be considered in some respects as a sequel to that noticed above.

As a mode of explaining how emery is used by the optician, we will briefly detail the common mode of making a convex lens, such as an "off-sight" spectacle lens. A grinding-tool is first prepared, by turning a piece of brass to a concave surface, and making it perfectly regular by the use of emery. Then a piece of glass, fitted for optical purposes, is cut to a circular form, and fixed with black pitch to a wooden handle, by which it may be conveniently held. The concave surface of the tool, being uppermost, is sprinkled with powdered emery, and the glass rubbed upon it till worn away to a convex surface. In such an operation it is evident that the brass does not act as an abrading surface; it is merely a receptacle properly shaped for receiving the emery-powder, and for regulating the movement of the glass while under the operation.

A very convenient form of using emery is when a thin stratum of it is cemented or glued to a sheet of paper. "Sand-paper," "glass-paper," and "emery-paper," are three examples of hard substances used in this way. The flinty particles which constitute sand, the hard particles of pounded glass, and pounded emery, have, according to the mode in which they are applied, degrees of hardness adapted to various processes in the mechanical arts. Other hard substances, more or less of a vitrified kind, are occasionally used for this purpose; thus, the slag, or exceedingly hard refuse from the iron-works, is in some towns ground to powder, and used, either singly or in combination with one of the other three materials above mentioned, as an abrading agent.

General Industry of England.—The extraordinary degree of producing power which exists in this kingdom has been shown in the second section of this work. Not only is the proportion of persons in the community who pass their lives in active industry, labouring with their hands or their heads, greater in this than in almost every other well-peopled country in Europe, but the amount of skilled labour performed in a given time by any given number of our countrymen is commonly greater than that accomplished by the like number of any other people in Europe. To this circumstance it is in great part owing that, with a higher rate of daily wages paid for fewer hours of toil than are required in other countries, our manufacturers have been able, under otherwise adverse circumstances, to maintain the superiority over their rivals. Many of those rivals, both in France and in Germany, have contrived to possess themselves of our best machines, notwithstanding the legal prohibition to their exportation; but having hitherto been unable to embue their workmen with the degree of energy and skill by which the English artisan is distinguished, are in general unable to compete with us in any but the commonest kinds of fabrics.—*Porter's Progress of the Nation.*

Improved Vegetable Food.—Among the questions that arise in the minds of the friends of the poor is, whether articles now rejected or neglected as food may not be sufficiently nutritious and palatable to be suited for ordinary consumption. We all know how largely prejudice is mixed up with our feelings on the subject of food, and that even the potato was at one time proscribed by the Puritans; a Middlesex peasant would not dream of cooking nettles, and yet in Yorkshire and Lancashire they are, when young, a common ingredient of broths; we also find that the French cottager will succeed in preparing good and wholesome food from substances which in this country are not thought of. Among these it is the kidney-bean which promises best. We use it only in the young and tender state. The French employ the ripe seed, and, when properly dressed, an excellent and agreeable food it proves to be. If, instead of cutting the young pods, and thus wasting the produce of such plants, they were allowed to ripen their beans, a saving of some importance would be effected in the economy of cottagers. We are led to these remarks by a letter from Mr. Billington, who mentions the following case:—"A very poor family in Shropshire being hardly pressed for food, the husband being unable to get employment, the wife bethought herself of some kidney-beans she had by her, and put some in an earthen vessel containing a sufficient quantity of water, a few lumps of bacon, with a little seasoning of pepper and salt, and placed them in an oven to stew, two or three hours, till they became as tender as the best boiling-peas." The peasants were agreeably surprised to find that the beans, which they had fancied unfit even for the food of pigs, would thus furnish them with a nice mess; for they did not know that such seeds are served up at the tables of the wealthy in this country under the name of haricots, and are a favourite vegetable with continental nations. Hitherto it has been the universal custom in this country to throw away the dried beans of the scarlet-runner, if not wanted for seed. We trust it will henceforth be remembered that excellent food may be had from one of those plants which now is made to scramble over the hedges and walls of a cottage garden chiefly for the sake of ornament. It must, however, be borne in mind that, although the beans of the scarlet-runner are good, the roots, which are fleshy and perennial, and look tempting enough to be eaten, are really poisonous, as was unfortunately proved last winter at Chelsea.—*Gardener's Chronicle.*